

## REMARKS

The indication of allowable subject matter in claims 6-14 and 23 is acknowledged and appreciated. In view of the following remarks, it is respectfully submitted that all claims are patentable over the cited prior art.

**I. CLAIMS 1-4, 21, 22 AND 24 ARE PATENTABLE OVER ONO ET AL. IN VIEW OF COBBLEY ET AL. AND IZUMI ET AL.**

Claims 1-4, 21, 22 and 24 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ono et al. '551 ("Ono") in view of Cobbley et al. '832 ("Cobbley") and Izumi et al '408 ("Izumi"). Claim 1 is independent. This rejection is respectfully traversed for the following reasons. In particular, it is submitted that the proposed combination is improper and even assuming *arguendo* proper, does not disclose or suggest the claimed invention.

**A. Proposed combination does not disclose claimed invention**

Claim 1 recites in pertinent part, "a separating/sealing step of separating said semiconductor device from said substrate ... if it is determined that said electrical properties are poor in said testing step, and *sealing* said semiconductor device and said substrate by means of a *sealing resin* if it is determined that said electrical properties are good in said testing step" (emphasis added). The Examiner admits that Ono does not disclose a testing step and therefore modifies Ono by adding the testing process disclosed by Cobbley thereto. The Examiner further admits that the testing step of "Cobbley et al. do not specifically disclose that the separation step is done after heating a bonding place ... " and therefore relies on Izumi as allegedly disclosing a heating step to soften the adhesive for a separation step.

As a preliminary matter, it is noted that Izumi is directed to an image detector using a conductive adhesive agent sandwiched between two substrates, wherein the adhesive agent is a combination of an insulative adhesive agent 7 mixed with conductive particles 8. As is well known, such a device is functionally remote from the flip-chip device of Ono and Cobbley. Nonetheless, even assuming *arguendo* the prior art is analogous, the proposed combination at best results in a process whereby the resin which *seals* the chip of Cobbley is heated for separation (“Encapsulate” box in Figures 2 and 4) so that the heating does not form part of the testing/reworking process of Cobbley. This is because the heating disclosed by Izumi is directed to an adhesive paste 3 which seals the opposing substrate 1 and 2. The adhesive paste 3 of Izumi therefore corresponds at best to the encapsulating resin of Cobbley (and resin 2 of Ono), rather than the pre-sealing connection of the point contacts defined by the epoxy dots 26 in Cobbley. It is respectfully submitted that any other interpretation would not be suggested by the prior art and would instead be based solely on improper hindsight reasoning.

It follows that the heating performed in Izumi would be conducted after the “Encapsulate” box in Figures 2 and 4 of Cobbley, rather than during the disclosed reworking of Cobbley, so as to not form part of the testing step of Cobbley. This distinction emphasizes the non-analogous nature between Cobbley/Ono and Izumi. Cobbley/Ono are directed to flip-chips where conductive adhesives are used at point contacts. Cobbley then discloses testing the point contacts and if successful, encapsulating the chip with resin as a finishing step. Accordingly, separation and reworking is performed only for the point contacts and *before* encapsulation. On the other hand, because Izumi is directed to an image detector, testing is needed after the

chips have already been sealed to determine quality of the sealed substrates. The heating is therefore performed *after* sealing the substrates.

The Examiner is directed to MPEP § 2143.03 under the section entitled "All Claim Limitations Must Be Taught or Suggested", which sets forth the applicable standard:

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (citing *In re Royka*, 180 USPQ 580 (CCPA 1974)).

In the instant case, the pending rejection does not "establish *prima facie* obviousness of [the] claimed invention" as recited in claim 1 because the proposed combination fails the "all the claim limitations" standard required under § 103.

**B. Proposed combination improper**

Furthermore, it is respectfully submitted that the Examiner has improperly modified a modifying reference. Although it is understood that there is no limit to the number of references that can be used to modify a *primary* reference in an attempt to reach the claimed invention, it is respectfully submitted that using a third reference to modify a feature taught in a *secondary* reference used to modify the primary reference is too attenuated from the claimed invention to be considered obvious.

In the instant case, the Examiner relies on Ono as the primary reference, and then relies on Cobbley as the secondary reference for modifying Ono by adding the testing procedure. The Examiner then modifies the testing procedure of Cobbley (i.e., secondary reference) with the heating disclosed by Izumi. Accordingly, the Examiner has improperly modified a modifying reference.

Furthermore, it is respectfully submitted that the Examiner's reliance on case law set forth in MPEP § 2144.07 as the motivation to make the proposed combinations is misplaced. As discussed in MPEP § 2144, the examiner may use the rationale used by the court only if the facts in a prior legal decision are sufficiently similar to those in an application under examination.

The Examiner relies on MPEP § 2144.07 under the heading "Art Recognized Suitability for an Intended Purpose" as support for the assertion that "one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed formation of the semiconductor unit ... ." However, the cited case law in MPEP § 2144.07 does not suggest seeking alternative methods *generally* as relied on by the Examiner. Instead, the case law in MPEP § 2144.07 describes *specific* fact patterns where selection of known materials having known uses, selected for their known uses, is obvious. The Examiner has not identified how those facts are similar to the facts of the present application, and it appears that no such correlation exists. For example, the Examiner's modification alleges obviousness of the claimed process steps and materials *functionally related to the method steps* (e.g., low melting point metal in claim 5), whereas the cited case law refers merely to material selection *per se* whose desired purpose is already known.

For all the foregoing reasons, it is respectfully submitted that claim 1 is patentable over the cited prior art.

## **II. DEPENDENT CLAIMS**

The Examiner has again not addressed the arguments previously made against the dependent claims. The Examiner is directed to MPEP § 707.07(f) under the heading “Answer All Material Traversed”, which requires the Examiner to respond to all arguments raised in Applicants’ response, including those directed to the patentability of the dependent claims.

In the instant case, it is respectfully submitted that the Examiner has not answered Applicants’ traverse with respect to the independent patentability of the dependent claims. Accordingly, if the Examiner maintains any one or more of the pending rejections, it is respectfully requested that the Examiner respond to arguments presented for the patentability of any claims whose rejections are maintained. For the Examiner’s convenience, the Applicants’ arguments for the dependent claims are reprinted below.

**For example, with respect to claims 22 and 23, neither Cobbley et al. nor Ono et al. disclose or suggest "wherein each of said regions in said bonding step is not involved in an electrical connection." In contrast, Ono et al. expressly discloses bonding chip 6 to circuit board 9 using conductive adhesives 4,5 in regions which are involved in electrical connection. That is, conductive adhesives 4,5 electrically connect the electrode pad 3 of the chip 6 to the terminal electrode 8 of the circuit board 9. Similarly, Cobbley et al. discloses bonding dice 28 and PCB 22 together using conductive epoxy dots 26 for making the *electrical connection* between the dice 28 and the PCB 22.**

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the

independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claim 1 is patentable for the reasons set forth above, it is respectfully submitted that all claims dependent thereon are also patentable. In addition, it is respectfully submitted that the dependent claims are patentable based on their own merits by adding novel and non-obvious features to the combination.

For example, new claim 25 recites in pertinent part “wherein the adhesive at each of said regions is *selectively* heated in said separating step.” Support for new claim 25 can be found, for example, on page 12, lines 9-13 of Applicants’ specification. In contrast, Izumi is silent as to a selective heating and rather suggest heating the entire adhesive 3 positioned between the substrates, thereby limiting the heating procedure and subjecting the conductive elements to risk of damage from the heating procedure.


### **III. CONCLUSION**

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner’s amendment, the Examiner is requested to call Applicants’ attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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